

CALIBRATION WORKING GROUP REPORT

AGENDA

Review of MODIS calibration working group meeting

ATBD review

Phil Slater

Scattered light discussion

Tom Pagano

Effect of replan on SBRC testing program

Tom Pagano

IR in-flight cross calibration

Paul Menzel

Calibration of thermal bands

Larry Goldberg

Discussion of MAT questions

Harry Montgomery/ Tom Pagano

Algorithm cross-comparisons

Attachment 10

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Calibration Plan/ATBD review

The Calibration Plan was judged in general to include an adequate number of accurate preflight, on-board, and vicarious methods for the solar reflective range, however it was considered weak in the thermal.

Major weaknesses related to lack of focus:

Level-1 production plan not well identified

Level-1 ATBD not presented

Uncertainty due to budget cuts, regarding what calibration inputs will be available at launch.

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Summary of Scattered Light discussion

MODIS may not meet the "transient response" specification because stray light was not originally included in the stray light response as an error. There are various sources:

- Ghosting

- Optical cross talk

- Electronic cross talk

- Primary scatter (mainly from the scan mirror)

This may also affect radiometric accuracy in the presence of clouds.

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Current status

Ghosting -- mostly fixed with redesign

Cross talk -- marginal but SNR is low in the measurements making it hard to determine

Primary scatter -- Mirror is within spec. but the spec. is probably not good enough. According to model results it will scatter too much from nearby bright, large clouds, especially in the shorter wavelengths. SBRC's contractor probably cannot measure the BSDF of the mirror at angles close to specular to correctly predict the performance.

For these reasons there is concern that the spec. will not be met.

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EFFECT OF REPLAN ON SBRC TESTING PROGRAM

Major changes:

1. Some MWIR/LWIR ^{tests} not done on the EM
2. Some tests will not be done with the MGBC, instead the IAC will be used for spatial response and the SSMA (spectral/scatter measurements assembly) will be used for "transient response".

Concerns:

1. T/V schedule for both the EM and PFM may be too short.
2. The preflight characterization of the PFM, (including the characterization and accuracy of the OBCs, particularly the SRCA) will not be completed until 4/96. This leaves little (inadequate) time to modify the OBC hardware and/or algorithms as a result of problems, such as scattered light, that might be discovered during characterization.

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IR IN-FLIGHT CROSS CALIBRATION

Paul Menzel is planning in-flight IR cross calibration work with GOES-I in the next year.

1. GOES-I will be compared to GOES/VAS and HIRS.
2. MAS and HIS will be flown to calibrate GOES-I.
3. The feasibility of determining GOES spectral response from interferometer data will be evaluated.

Newer instruments will be available during the MODIS era.

Paul estimates that TOA radiances should be available within 0.5 K with a goal of 0.3 K (error of less than 1% in radiance).

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BLACKBODY CALIBRATION CONCERNS

For the laboratory blackbody calibration source (BCS):

1. Casual observation shows reflections in the visible off the blackbody surface. Since the reflectance increases with wavelength, the claim that the emissivity in the thermal is >0.9997 needs to be verified.

Action item: W Barnes and R Weber by next MST meeting.

2. Were witness samples or the actual surface measured for BRDF in order to model the emissivity? If witness samples were used, how representative were they of the real surface?

Action item: W Barnes and R Weber be the next MST meeting.

3. Funding for the thermal transfer radiometers is, at best, uncertain. There will probably be **no** measurements to verify the **modeling** of the radiance output of the blackbodies. As the calibration requirements for certain thermal bands are stringent, there is substantial risk here.